

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 86983

86983

Page 2

Friday, July 06, 2012 12:42:34 PM

Item ID: D212-664-101

Accept

N900040100

Setup

Start

NS1

Stop

NS2

Revision ID:

Item Name: Crosstube Fwd

Start Date: 7/6/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 7/25/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run

Start

NR1

Stop

NR2

QC:

Date:

SPC (Y/N):

Date:

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

130

QC15- Crosstube Dimensional Check

0.00

045
15
2-89

210717#1

④

130

QC

Quality Control

140

140

Crosstubes

Crosstubes

0.00

Memo

0.00

1-Drill pilot holes in tube as per Dwg D212-664-141 using drill Jig DT8548 & DT8549, using drill table DT8577, set-up towers in hole #7 as per QSI 10

2-Ream hole to finish size in tube as per Dwg D212-664-141 using drill Jig DT8548 & DT8549. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes.

3-Scribe part # and batch # using vibrating stylus as per Dwg D212-664-141

4-*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D212-664-141

Mo

12-7-24

Mo

12-7-24

W/O:		WORK ORDER CHANGES							
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- Work Order ID 86983

Friday, July 06, 2012 12:42:34 PM

86983

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Item ID: D212-664-101

Accept

N900040100

Setup

Start

NS1

Revision ID:

Item Name: Crosstube Fwd

Stop

NS2

Start Date: 7/6/2012 Start Qty: 1.00 *1*

Cust Item ID:

Required Date: 7/25/2012 Req'd Qty: 1.00 *1*

Customer:

Reference:

Approvals:	Process Plan:	Date:	Tooling:	Date:	Run	Start	*NR1*
	QC:	Date:	SPC (Y/N):	Date:	Stop		*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150 *150* QC Quality Control	QC5- Inspect part completeness to step on W/O Memo *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***	0.00 0.00	DAS 16 9-89	2/07/26					
160 *160* HandFXtube Hand Finishing Crosstubes	 Memo *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** 1- CLEAN CROSSTUBE WITH WASH'N WIPE	0.00 0.00				1			12/07/27
170 *170* Outsource2 Outsource process - NDT	Outsource process - NDT per QSI038 4.1 Memo *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Liquid Penetrant Inspection as per QSI 038 Issue P/O: 17556 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order	0.00 0.00							12/07/27

W/O:		WORK ORDER CHANGES					
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Work Order ID 86983
Friday, July 06, 2012 12:42:34 PM

86983

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Item ID: D212-664-101

Accept

N900040100

Setup

Start

NS1

Revision ID:

Item Name: Crosstube Fwd

Stop

NS2

Start Date: 7/6/2012 Start Qty: 1.00 *1*

Cust Item ID:

Required Date: 7/25/2012 Req'd Qty: 1.00 *1*

Customer:

Reference:

Approvals:	Process Plan:	Date:	Tooling:	Date:	Run	Start	*NR1*
	QC:	Date:	SPC (Y/N):	Date:	Stop		*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

195 QC7-Inspect Chemical Conversion Coat 0.00

195

QC

Quality Control

200 Spray Painting per QSI005 4.2 0.00

200 SprayPaint

SprayPaint

Spray Painting

Memo 0.00

*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***

1-Prime inside and outside crosstube as per QSI 005 4.2

2-Paint outside crosstube as per DEO D212-667-141 with White Imron as per
QSI 005 4.2

PRIME: 117319
Start Time: 7:00 > 12:07:31
Finish Time: 8:00

PAINT: 120361
Start Time: 3:00 > 12:08:01
Finish Time: 4:00

12/07/28

12/08/01

W/O:

WORK ORDER CHANGES

DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Work Order ID 86983

Friday, July 06, 2012 12:42:34 PM

86983

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Item ID: D212-664-101

Accept

N900040100

Setup

Start

NS1

Revision ID:

Item Name: Crosstube Fwd

Stop

NS2

Start Date: 7/6/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 7/25/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run

Start

NR1

QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop

NR2

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

210

QC14- Inspect Spray Paint

0.00

210

QC

Quality Control

DAS
16
9-33

7/6/12

220

Crosstubes

0.00

220

Crosstubes

0.00

Crosstubes

Memo
1-Abrade mating surfaces of support and crosstube with 400 grit sandpaper,
clean the area with 4105S wash 'n' wipe

A8 12-8-2

2-Install supports with Proseal 890 per DSI9563 and QSI 015
A/R Proseal 890 Batch: 122441

3- Torque bolts as per dwg

230

QC6- Inspect dimensions to drawing

0.00

230

QC

Quality Control

DAS
16
9-33

7/6/12

W/O:		WORK ORDER CHANGES					
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Item ID: D212-664-101

Accept

N900040100

Setup

Start

NS1

Revision ID:

Item Name: Crosstube Fwd

Stop

NS2

Start Date: 7/6/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 7/25/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run

Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

240

240

Packaging

Packaging

Pick Kit

0.00

12/8/3 SF

Memo

0.00

250

250

QC

Quality Control

QC4- 100% Inspect kits for completeness

0.00

DAS
16
8-8

12/8/3 SF

Memo

0.00

260

260

Packaging

Packaging

Packaging

0.00

Loc
103

Memo

0.00

Identify and pack for shipping as per PPP D212-664-101

12/8/3 SF

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Work Order ID 86983
Friday, July 06, 2012 12:42:34 PM

86983

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Item ID: D212-664-101

Accept

N900040100

Setup Start

NS1

Revision ID:

Item Name: Crosstube Fwd

Stop

NS2

Start Date: 7/6/2012 Start Qty: 1.00 *1*

Cust Item ID:

Required Date: 7/25/2012 Req'd Qty: 1.00 *1*

Customer:

Reference:

Approvals: Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run Start

NR1

QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop

NR2

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

270

QC21- Final Inspection - Work Order Release

0.00

270

QC

Quality Control

Memo

0.00

MLJ 12/08/03

MLJ 12/08/03

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Picklist Print

Page 1

Friday, July 06, 2012 12:42:38 PM

Work Order ID: 86983

86983
D212-664-101

Parent Item: D212-664-101

Parent Item Name: Crosstube Fwd

Start Date: 7/6/2012

Required Date: 7/25/2012

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:E04.02.16ReformatKJ/DS

IPP Rev:F 06-03-29 Remove Coments on Pick List JLM

IPP Rev:G 07-04-30 As per Rev C JLM IPP Rev:H

11.04.26 inspection strip ecn 11-549 EC verified by:DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

D212-664-101TRN

Manufactured

No

110

Each

2.0000

1

1

**

12-7-23

D212-664-101TRN

Crosstube Turning Detail

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG 87886	2	
85829	1	

1

D3595-063-450

Manufactured

No

230

Each

105.0895

4

4.210526

**

12-8-2

D3595-063-450

RUBBER CUSHION

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG 9.28		
82511 9.28		
LG051 85.7		
80161 1.7		
84715 84		
MAT052 10.109474		
67353 2		
68893 6		
70113 0.56		
71354 0.2		
74113 0.349474		
75597 1		

(4)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Picklist Print

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Friday, July 06, 2012 12:42:38 PM

Work Order ID: 86983

Parent Item: D212-664-101

Parent Item Name: Crosstube Fwd

86983
D212-664-101

Start Date: 7/6/2012

Start Qty: 1.00

Required Date: 7/25/2012

Required Qty: 1.00

MS21920-25

Purchased No

220

Each

136.0000

4

4

**

Al 12-8-2

MS21920-25

Clamp(per MIL-DTL-8783C)

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG050	117	
116264	2	
117998	4	
118142	4	
119339	2	
119746	2	
120475	7	
120920	46	
122204	50	
LG051	19	
121583	19	

D2893-1

Manufactured No

220

Each

16.0000

2

2

**

Al 12-8-2

D2893-1

2.75 Support

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG	9	
83056	9	
LG052	7	
72865	2	
80271	4	
82228	1	

W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Friday, July 06, 2012 12:42:38 PM

Work Order ID: 86983

86983
D212-664-101

Parent Item: D212-664-101

Parent Item Name: Crosstube Fwd

Start Date: 7/6/2012

Start Qty: 1.00

Required Date: 7/25/2012

Required Qty: 1.00

D3428-1

D3428-1
Placard

Manufactured	No	240	Each	33.0000	0	1
--------------	----	-----	------	---------	---	---

**

Location	Loc Qty	Loc Code
ST042	33	
78933	2	
81881	9	
83582	10	1
85228	12	

AN6-35A
AN6-35A
BOLT

Purchased	No	240	Each	42.0000	4	4
-----------	----	-----	------	---------	---	---

**

M122416

Location	Loc Qty	Loc Code
342	42	
121181	42	

AN6-36A
AN6-36A
Bolt

Purchased	No	240	Each	47.0000	4	4
-----------	----	-----	------	---------	---	---

**

M122416

C 50
p18/3

Location	Loc Qty	Loc Code
ST342	47	
118422	2	
119449	1	
120187	4	
120423	40	

W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Picklist Print

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Friday, July 06, 2012 12:42:38 PM

Work Order ID: 86983

86983
D212-664-101

Parent Item: D212-664-101

Start Date: 7/6/2012

Required Date: 7/25/2012

Parent Item Name: Crosstube Fwd

Start Qty: 1.00

Required Qty: 1.00

MS21042L6

Purchased No 240 Each 497.0000

S MS21042L6*

Nut

6 6
**

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
ST300	497	
117677	25	
118384	3	
118927	48	
119075	221	6
120308	200	1

240 Each 0.0000

18 18
** M122452 12/13/12

AN960JD616

NAS1149D0663J Purchased No

S *AN960JD616*

Washer

W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE			By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

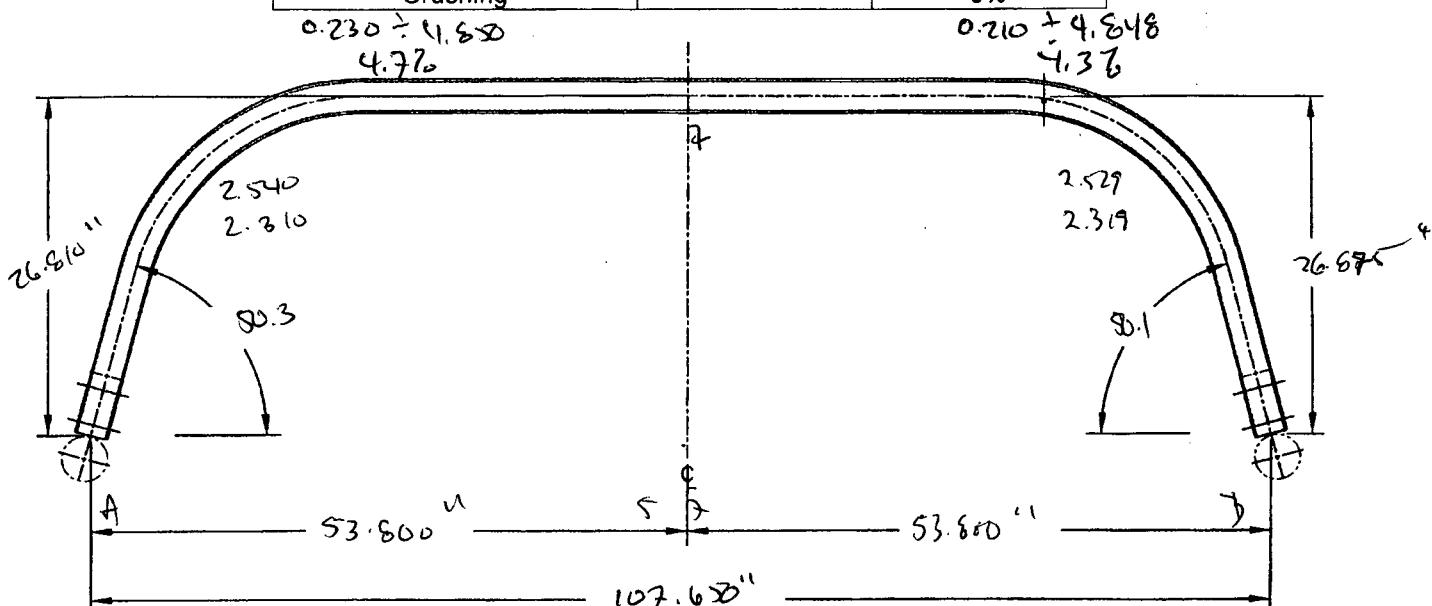
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DART AEROSPACE LTD	Work Order:	869 E3
Description: Crosstube High Fwd (205/212/412)	Part Number:	D212-664-101
Inspection Dwg: D212-664-141 Rev: D		Page 1 of 1

Required Dimension	Min	Max
Height	26.79	27.05
1/2 Span	53.59	53.85
Angle	49	52
Total Span	107.18	107.7
Bending Passes	3	--
Crushing	--	6%



	Side A	Side B
Bending Passes	5	7
Crushing	4.770	4.370
Comments		
Side A = 5 passes middle = 7 passes Side B = 7 passes		

QC15 Inspection	(DAS)
Date	16/04/24

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	08.04.21	Dwg Rev updated	KJ/JM	
C	10.04.01	Dwg Rev updated	KJ	
D	12.04.16	Added bending, crushing dimensions	KJ	W

W/O:		WORK ORDER CHANGES					
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8 7 6 5 4 3 2 1

Item	Qty -141	Qty -141B	Part Number	Description
1	X		D212-664-141	CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD)
2		X	D212-664-141B	CROSSTUBE ASSEMBLY (214 HIGH FWD)
3	1	1	D6005-128	CROSSTUBE
4	2	2	D2893-1	SUPPORT
5	4	4	D3595-063-450	RUBBER CUSHION
6	4	4	MS21920-25	CLAMP (OR MS21920-26)
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6005-128
FINISHED LENGTH = 126.514±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS
- 7) WEIGHT: D212-664-141 = 33.6 lbs (PER IIN-D212-664)
D212-664-141B = 33.6 lbs (PER IIN-D212-664)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY. TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE D2893-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER

NO. 86983

REMOVED FROM UNDER REVIEW PER
IIN-D212-664
UNDER REVIEW
08/12/07-4
4/10/08
FOR PAY SEALING SUPPORT
08/03/08

DEO ATTACHED

RELEASED
2009-10-29
M

D	REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -141B (ZN B4-2, D4-2); REMOVED REF & ADD TOLERANCES (ZN B4-3, C6-3, C8-3 & B8-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	09.09.30
C	REMOVE -851 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	PH	00.12.12
REV.	DESCRIPTION	BY	DATE

DESIGN	<u>PH</u>	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	<u>PH</u>	DRAWING NO.	REV. D
MFG. APPR.	<u>DS</u>	D212-664-141	SHEET 1 OF 4
APPROVED	<u>PH</u>	TITLE	SCALE
DE APPR.	<u>PH</u>	XTUBE ASSY (205/212/412 HI FWD)	NTS
DATE	09.09.30	COPYRIGHT © 2008 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT WAS PROVIDED WITHOUT PERMISSION FROM DART AEROSPACE LTD.	

8 7 6 5 4 3 2 1

D

C

B

A

1

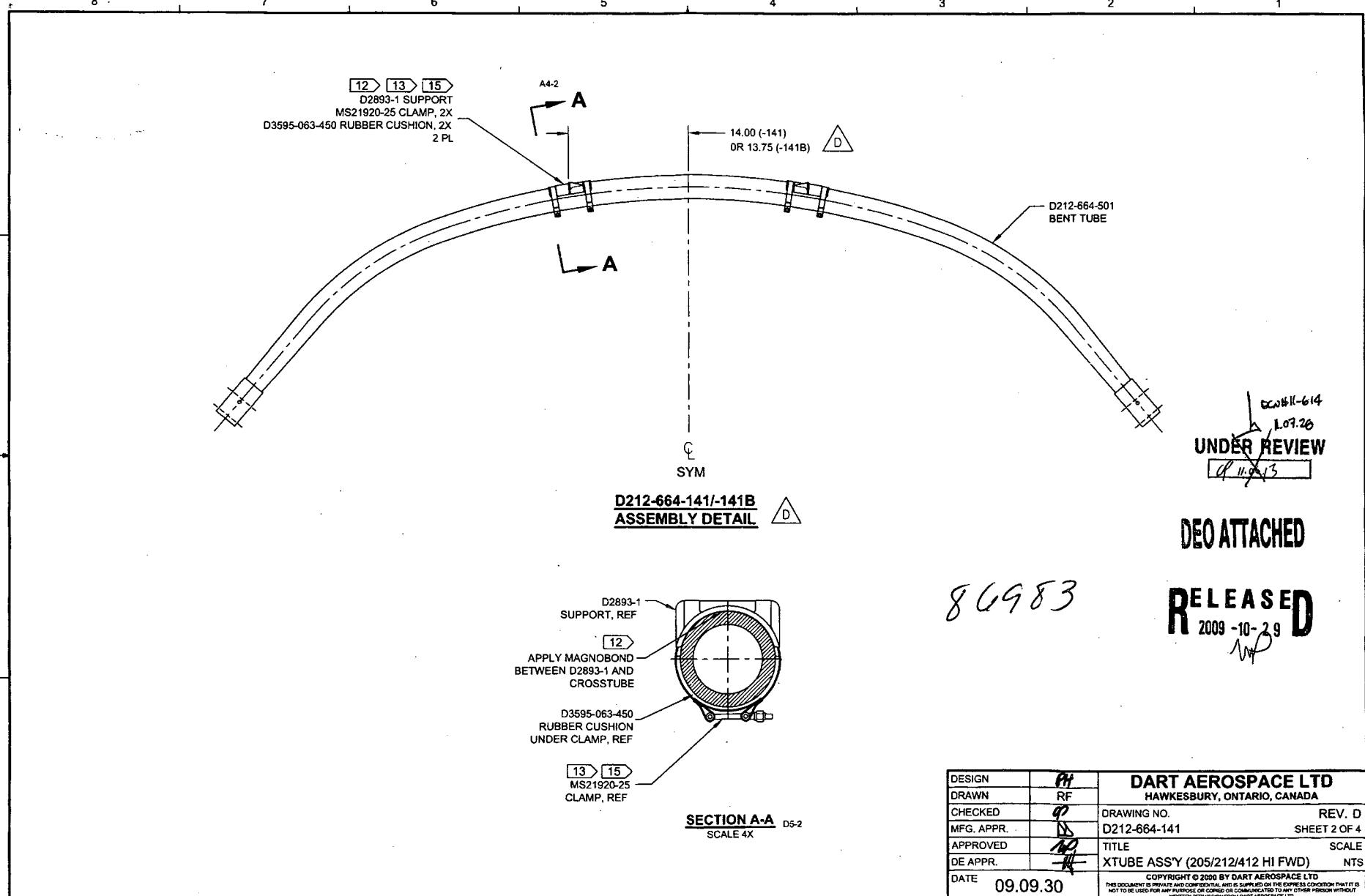
W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



DESIGN	PH	DART AEROSPACE LTD
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA
CHECKED	PP	REV. D
MFG. APPR.	DS	DRAWING NO. D212-664-141 SHEET 2 OF 4
APPROVED	AD	TITLE XTUBE ASS'Y (205/212/412 HI FWD) NTS
DE APPR.	TH	DATE 09.09.30

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

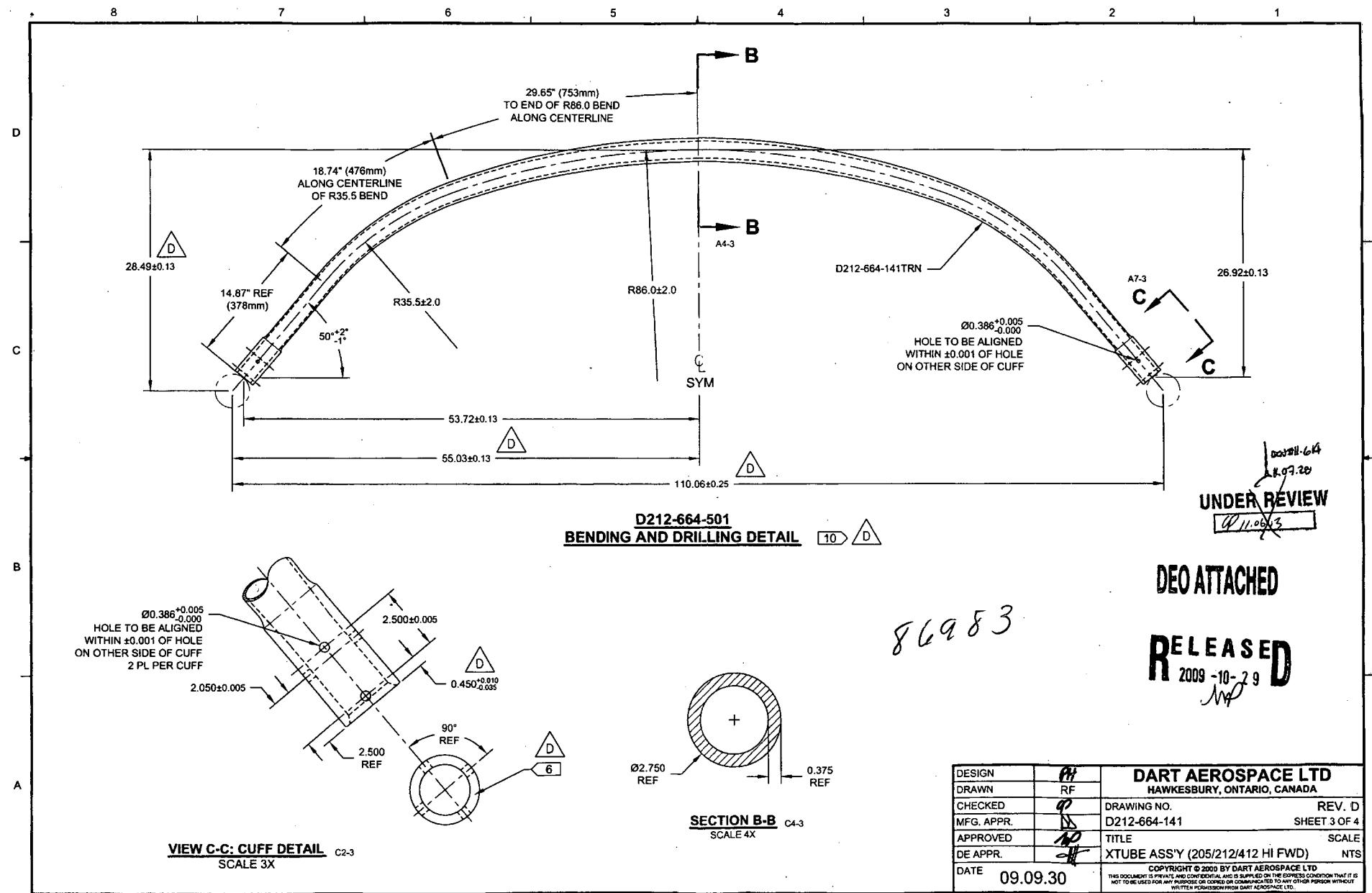
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

8 7 6 5 4 3 2 1



DESIGN	A4	DART AEROSPACE LTD
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA
CHECKED	PP	DRAWING NO.
MFG. APPR.	AS	REV. D
APPROVED	AP	D212-664-141
DE APPR.	SH	SHEET 3 OF 4
DATE	09.09.30	TITLE
		XTUBE ASS'Y (205/212/412 HI FWD) NTS

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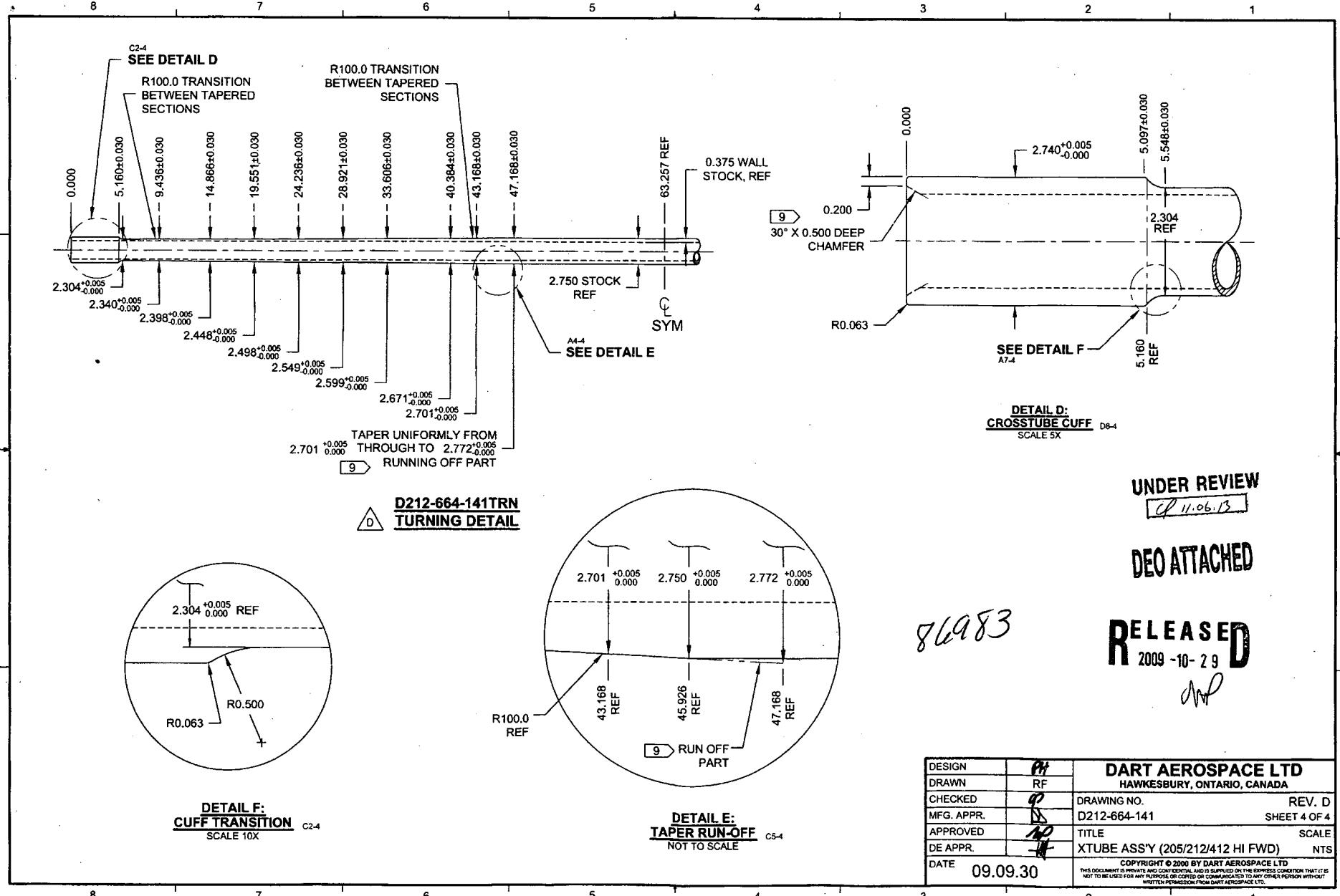
W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



W/O:		WORK ORDER CHANGES							
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DATE	STEP	Description of NC Section A	Corrective Action Section B				Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date				

NOTE: Date & initial all entries

DRAWING NO.	TITLE	REV. D	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO.	SHEET NO.	SCALE
D212-664-141	XTUBE ASSY (205/212/412 HI FWD)			D212-664-141-D-1	SHEET 1 OF 2	NTS
DRAWN	CHECKED	IP	MFG. APPR. EC	APPROVED MP	DE APPR. JH	
DATE 11.04.07	DATE 11.04.11	DATE 11.04.12	DATE 11/09/12	DATE 11.04.12		

PURPOSE:

ADD AN INSPECTION WINDOW TO UNDERSIDE OF CROSSTUBE.

RELEASED
2011-04-18
JH

CHANGE:

NOTES 2 OF SHEET 1 IS AMENDED AS FOLLOWS:

IS:

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
 MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND
 PAINT OUTSIDE PER DART QSI 005 4.2
 REMOVE MASKING AND APPLY CLEAR COAT

WAS:

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
 PAINT OUTSIDE PER DART QSI 005 4.2

UNDER REVIEW

11/06.13
D212-664
11.07.28

86983

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DRAWING NO. D212-664-141	TITLE XTUBE ASSY (205/212/412 HI FWD)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO. D212-664-141-D-1	SHEET NO. SHEET 2 OF 2	SCALE NTS
DRAWN	CHECKED	CP	MFG. APPR.	CZ	APPROVED	WAD
DATE 11.04.07	DATE 11.04.11	DATE 11.04.12	DATE 11.04.12	DATE 11.04.12	DATE 11.04.12	DATE 11.04.12

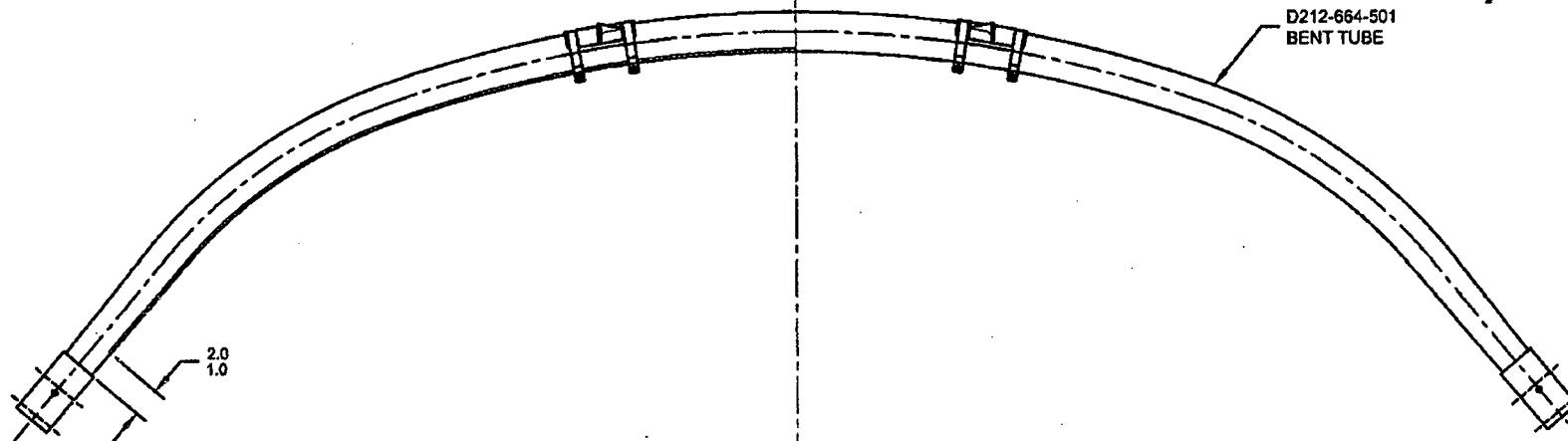
UNDER REVIEW

GP 11/06/13

EC0411-614
11.07.28

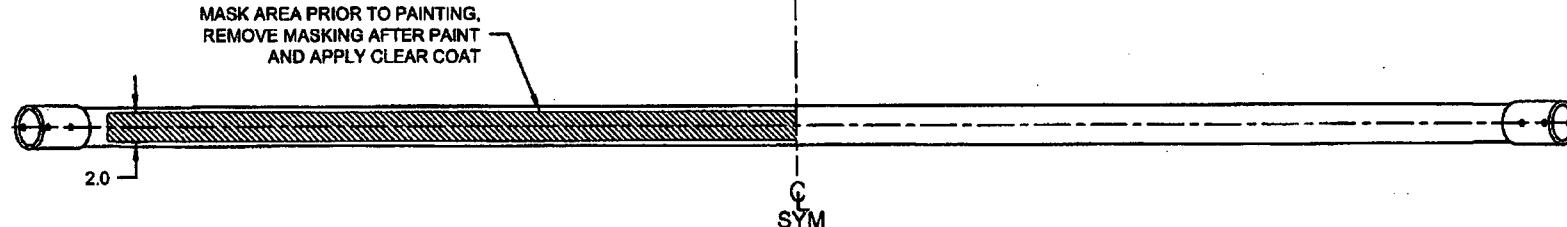
IS:

WAS:



**D212-664-141/141B
ASSEMBLY DETAIL**

869 83



W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DRAWING NO. D212-664-141	TITLE CROSSTUBE ASS'Y (205 HI FWD)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO. D212-664-141-D-2	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>IP</i>	CHECKED <i>AS</i>	MFG. APPR. <i>AB</i>	APPROVED <i>IP</i>	DE APPR. <i>IP</i>		
DATE 11.07.15	DATE 11.07.20	DATE 11.07.21	DATE 11.07.21	DATE 11.07.21	DATE 11.07.21	

PURPOSE:
REPLACE MAGNOBOND WITH PROSEAL.

CHANGE:

IS:

Item	Qty -141	Qty -141B	Part Number	Description
7	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

WAS:

7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
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NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 12) TO INSTALL D2893-1 SUPPORT: ABRADE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

WAS:

- 12) INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.



86983

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

5.0 PARTS LIST

5.1 HIGH GEAR CROSSTUBES

Item	-104-	-201	-203	Part Number	Description
	X			D212-664-101	CROSSTUBE INSTALLATION, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH FWD
		X		D212-664-201	CROSSTUBE INSTALLATION, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH AFT
			X	D412-664-203	CROSSTUBE INSTALLATION, 412 HIGH AFT
1	1			D212-664-141	CROSSTUBE ASSEMBLY, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH FWD
2		1		D212-664-241	CROSSTUBE ASSEMBLY, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH AFT
3			1	D412-664-243	CROSSTUBE ASSEMBLY, 412 HIGH AFT
10	2			* D2893-1	SUPPORT
11	4			* D3595-063-450	RUBBER CUSHION
12	4			* MS21920-25	CLAMP (OR MS21042-26)
13	4			AN6-35A	BOLT
14	4			AN6-36A	BOLT
15	6			MS21042L6	NUT (OR MS21042-6)
16	18			-AN960JD616	WASHER
20	2			* D2940-1	SUPPORT
21	4			* D3595-063-530	RUBBER CUSHION
22	4			* MS21920-28	CLAMP (OR MS21042-30)
23	4			AN6-40A	BOLT
24	2			AN6-41A	BOLT
25	6			MS21042L6	NUT (OR MS21042-6)
26	18			AN960JD616	WASHER
30		1		* D2896-1	SUPPORT
32		2		* D3595-063-570	RUBBER CUSHION
33		4		* MS21920-28	CLAMP
34		2		* MS21920-30	CLAMP (OR MS21042-32)
35		4		AN6-40A	BOLT
36		2		AN6-41A	BOLT
37		6		MS21042L6	NUT (OR MS21042-6)
38		18		AN960JD616	WASHER
39		2		* D3189-1	CHAFING SHIELD
50	1	1		*D3428-1	PLACARD

*REFERENCE ONLY. PARTS ARE INCLUDED IN D212-664-141/-241 OR D412-664-243 ASSEMBLIES ABOVE

NOTE: KITS INCLUDE EXTRA HARDWARE FOR COMPATIBILITY WITH BOTH DART AND BELL/AI SKIDTUBES.



LIQUID PENETRANT TEST REPORT

P- 12677

CLIENT DALT Aero Space DATE 14/07/12 PAGE 1 OF 1
 ATTENTION MAT / LINDA TIME AM PM
 ADDRESS 1270 ABERDEEN ST. ACUREN JOB NO. 188-12-00293
HAWKESBURY ONT. PO/WO NO. 17556 -
 WORK LOCATION SALE
 ACCEPTANCE STD ASME 1417/051-08 REV./DATE 2005
 PROJECT F.P.I. ON CROSS TUBE
 ITEM(S) EXAMINED 10 PCS

JOB DESCRIPTION	PROCEDURE NO. LT <u>002</u>	REV./DATE <u>2008</u>	TECHNIQUE NO. LT <u>002</u>	REV./DATE <u>2008</u>
PART NO.	<u>SEE RESULTS</u>			
SCOPE	<u>A WET FLUORESCENT LIQUID PENETRANT EXAMINATION WAS</u> <u>DOE ON THE 100% OF SURFACE ONLY</u>			
TEST DETAILS				
METHOD	<input checked="" type="checkbox"/> FLUORESCENT	<input type="checkbox"/> VISIBLE	<input type="checkbox"/> WATER WASH	<input type="checkbox"/> SOLVENT REMOVABLE
FAMILY BRAND	<u>MENAFLOC</u>			
PENETRANT	<u>2L67</u>	MINIMUM DWELL TIME <u>45 10</u> MIN.	BLACK LIGHT S/N <u>16459</u>	<input type="checkbox"/> OUTPUT > 1000 μ W/cm ²
PENETRANT REMOVER	<u>A20</u>	MINIMUM DRY TIME <u>>10</u> MIN.	LIGHTING EQUIP. <input type="checkbox"/> FLASHLIGHT <input type="checkbox"/> TROUBLELIGHT	<input type="checkbox"/> OUTPUT > 100 fc @ SURFACE
DEVELOPER	<u>SKD 52</u>	MINIMUM DWELL TIME <u>10</u> MIN.	OTHER <u>LABINO</u>	<input type="checkbox"/> OTHER
DEVELOPER TYPE	<input type="checkbox"/> NON AQUEOUS	<input type="checkbox"/> AQUEOUS	LIGHT METER S/N <u>1098866</u>	CAL DUE DATE <u>14/08/2012</u>

SURFACE CONDITION	<input type="checkbox"/> AS GROUND	<input type="checkbox"/> AS WELDED	<input type="checkbox"/> MACHINED	<input type="checkbox"/> SHOT BLASTED	<input type="checkbox"/> CLEAN BARE METAL
SURFACE TEMPERATURE	<input type="checkbox"/> < -4°C/ 20°F	<input type="checkbox"/> -4°C/ 20°F TO 10°C/50°F	<input type="checkbox"/> 10°C/50°F TO 52°C/125°F	<input type="checkbox"/> > 52°C/125°F	

RESULTS- <input type="checkbox"/> METRIC <input type="checkbox"/> IMPERIAL																																
<p><u>CROSS TUBE W.O. #</u></p> <table border="1"> <tr> <td>1</td> <td>87294</td> <td>✓</td> </tr> <tr> <td>1</td> <td>87296</td> <td>✓</td> </tr> <tr> <td>1</td> <td>87297</td> <td>✓</td> </tr> <tr> <td>1</td> <td>87293</td> <td>✓</td> </tr> <tr> <td>1</td> <td>86982</td> <td>✓</td> </tr> <tr> <td>1</td> <td>86842</td> <td>✓</td> </tr> <tr> <td>1</td> <td>86840</td> <td>✓</td> </tr> <tr> <td>1</td> <td>86983</td> <td>✓</td> </tr> <tr> <td>1</td> <td>86841</td> <td>✓</td> </tr> <tr> <td>1</td> <td>83084</td> <td>✓</td> </tr> </table> <p><u>REMOVED ON THIS CROSS TUBE</u> <u>ONE TIME TO REMOVE END OTHERS</u></p> <p><u>14/07/2012</u></p>			1	87294	✓	1	87296	✓	1	87297	✓	1	87293	✓	1	86982	✓	1	86842	✓	1	86840	✓	1	86983	✓	1	86841	✓	1	83084	✓
1	87294	✓																														
1	87296	✓																														
1	87297	✓																														
1	87293	✓																														
1	86982	✓																														
1	86842	✓																														
1	86840	✓																														
1	86983	✓																														
1	86841	✓																														
1	83084	✓																														

Scope of Services
 The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as a representation or warranty. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Performance of services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES		
CLIENT REPRESENTATIVE	<u>MATT MORRISON</u> PRINT	SIGNATURE
TECHNICIAN (SIGNATURE):	<u>M. JEFFERSON</u>	REPORT REVIEWED BY:
NAME (PRINT):	<u>M. JEFFERSON</u> 1 ST TECHNICIAN CGSB LEVEL <u>IC</u> SNT LEVEL <u>IC</u> CGSB REG. NO. <u>C6006</u>	NAME INITIALS
	2 ND TECHNICIAN CGSB LEVEL _____ SNT LEVEL _____ CGSB REG. NO. _____	